configuring the switching network with (i) 2^n output groups, each of the output groups having a distinct binary address in the form of $b_1b_2...b_n$ with b indistinguishable output ports, and (ii) k super-stages of concentrators wherein each of the concentrators is a 2b×2b partial sorting network of interconnected routing cells and b of its 2b output ports are grouped into a 0-output group while the remaining b output ports are grouped into a 1-output group, the network being characterized by guide $\gamma(1), \gamma(2), \ldots, \gamma(k)$, where γ is a mapping from the set $\{1, 2, \ldots, k\}$ to the set $\{1, 2, \ldots, n\}$, and wherein the packet is either a real data packet destined for the output group at the binary destination address $d_1d_2...d_n$, or an idle packet having no pre-determined destination, (b) generating a routing tag $1d_{\gamma(1)}d_{\gamma(2)}...d_{\gamma(k)}$ for the real data packet with reference to the guide of the network and the destination address of the packet; and (c) routing the real data packet through the network by using $1d_{\gamma(j)}$ in the routing tag in the j-th super-stage concentrator, $1 \leq j \leq k$, to select between the 0-output group or the 1-output group of the j-th super-stage concentrator to emit the real data packet.

In accordance with a broad system aspect of the present invention, a system for self-routing a packet includes: (a) a $b2^n \times b2^n$ switching network, the switching network having (i) 2^n output groups, each of the output groups having a distinct binary address in the form of $b_1b_2...b_n$ with b indistinguishable output ports, and (ii) k super-stages of concentrators wherein each of the concentrators is a 2b×2b partial sorting network of interconnected routing cells and b of its 2b output ports are grouped into a 0-output group while the remaining b output ports are grouped into a 1-output group, the network being characterized by the guide $\gamma(1), \gamma(2), \ldots, \gamma(k)$, where γ is a mapping from the set $\{1, 2, \ldots, k\}$ to the set $\{1, 2, \ldots, n\}$, and wherein the packet is either a real data

packet destined for the output group at the binary destination address $d_1d_2...d_n$, or an idle packet having no pre-determined destination; (b) routing tag circuitry for generating a routing tag $1d_{\gamma(1)}d_{\gamma(2)}...d_{\gamma(k)}$ for the real data packet with reference to the guide of the network and the destination address of the packet; and (c) routing control circuitry for routing the real data packet through the network by using $1d_{\gamma(j)}$ in the routing tag in the j-th super-stage concentrator, $1 \leq j \leq k$, to select one between the 0-output group or the 1-output group of the j-th super-stage concentrator to emit the real data packet.--.

A1 Cont.

Please replace lines 1-3 on page 13 as follows: --

FIG. 21B depicts a (1 2 3) permutation on an 8×8 exchange;

FIG. 21C depicts a (3 1) permutation on an 8×8 exchange;

FIG. 21D depicts a combined (1 4)(2 3) permutation on an 8×8 exchange;--.

A2

Page 195, replace line 13 as follows: --possible number of 1-bound signals to the 1-output group. For a 2b-to-b concentrator --.

Page 195, replace line 17 as follows: --concentrator composed of interconnected routing cells meets this criterion perfectly for --.

Page 196, replace line 4 as follows: --banyan-type network. The 2b-to-b concentrator composed of interconnected routing--.

Page 196, replace line 15 as follows: --concentrator composed of interconnected routing cells can be substituted by a 2b-to-b--.

Page 196, replace line 16 as follows: --concentrator composed of interconnected 0-1 sorting cells. The same applies throughout--.

Page 197, replace line 10 as follows: --a 2b-to-b concentrator composed of interconnected routing cells. The hybrid network--.

Page 197, replace line 13 as follows: --of routing cells, and the in-band control signal of a packet changes only between--.

Page 198, replace line 5 as follows: --for $1 \leq j \leq n$, the in-band control signal to a concentrator in the j^{th} super-stage is $1d_{\gamma(j)}$.--.

Page 200, replace line 8 as follows: --A concentrator composed of interconnected routing cells is a--.

Please replace page 229, namely, the "Abstract of the Disclosure", with the following:

--ABSTRACT OF THE DISCLOSURE

Application of the technique of statistical line grouping to banyan-type networks to practically alleviate the problems of output contention, traffic fluctuation, burstiness, and so forth without incurring additional preprocessing and buffering on the input traffic by introducing alternate-routing ingredient to the unique-routing banyan-type network, but does not complicate the switching control too much through alternate routing. The concentrator composed of interconnected routing cells is employed to fill in each of the dilated nodes of the banyan-type network to give a hybrid network. An extremely simple self-routing control mechanism over the hybrid network which is the natural melting of the self-routing control inside the concentrators and the self-routing control over the banyan-type network is presented.--.

A3

In the Claims: